

## ABSTRACT

1 A surface micromachining process for the fabrication of  
2 three-dimensional micro-hinges directly on silicon on  
3 insulator wafers. The process includes the steps of (a)  
4 defining openings around the surface of a desired hinge  
5 pin in a single layer of a silicon single crystal; (b)  
6 subjecting the openings to an etching process for removal  
7 of oxide material that is located in contiguous relation  
8 to the openings under the area of a hinge; (c) growing  
9 thermal oxide to define a gap between the hinge pin and a  
10 subsequently deposited polysilicon cap; (d) immediately  
11 depositing a thin layer of a chemical vapor deposited  
12 oxide sufficient to cover fine gaps not completely  
13 covered by the thermal oxide; depositing polysilicon and  
14 etching to define a hinge cap; and further etching to  
15 allow a mirror to be lifted out of the silicon wafer.